CLAIMS

1. A switching power supply comprising:

a plurality of converters, each comprising a plurality of switching means, transforming means and rectifying means, connected in series on the input sides and in parallel on the output sides, thereby outputting a single output DC voltage,

a first error amplifier for generating a first error signal by comparing said single output DC voltage output from said converters with a reference voltage and for amplifying said first error signal,

an arithmetic unit for generating a single output current signal by detecting the currents output from said rectifying means of said plurality of converters,

a second error amplifier for generating a second error signal by comparing said single output current signal from said arithmetic unit with the output of said first error amplifier and for amplifying said second error signal, and

a plurality of PWM signal generators for generating PWM signals on the basis of the output signal of said second error amplifier and for PWM controlling said plurality of switching means.

2. The switching power supply in accordance

with claim 1, wherein each of said PWM signal generators comprises a triangular wave generator for generating a reference triangular wave signal, a comparator for comparing said reference triangular wave signal of said triangular wave generator with said output signal of said second error amplifier, and a distributor for generating a PWM signal on the basis of the comparison result of said comparator and for PWM controlling said switching means corresponding thereto.

3. The switching power supply in accordance with claim 2, wherein each of Q pieces of converters has a plurality of capacitors connected in series across the input terminals, said capacitors are connected to different switching means, the triangular wave generators of Q pieces of PWM signal generators output reference triangular wave signals having a phase difference of π/Q therebetween, and said PWM signal generator changes the switching timing of each converter by using said reference triangular wave signal and said output signal of said second error amplifier.

4. The switching power supply in accordance with any one of claims 1 to 3, wherein said arithmetic

unit is formed of an adder, and said adder adds the currents output from said respective rectifying means of said plurality of converters to generate said single output current signal.

5. The switching power supply in accordance with any one of claims 1 to 3, wherein said converter is formed of a half-bridge converter.

6. The switching power supply in accordance with any one of claims 1 to 3, wherein the phase of said PWM signal generated by said PWM signal generator is shifted at substantially equal intervals.

7. The switching power supply in accordance with any one of claims 1 to 3, wherein electric power is supplied to semiconductor devices.

8. A control method for a switching power supply comprising a plurality of converters, each comprising a plurality of switching means, transforming means and rectifying means, connected in series on the input sides and in parallel on the output sides, thereby outputting a single output DC voltage, comprising

a step of generating a first error signal by

comparing said single output DC voltage with a reference voltage and of amplifying said first error signal,

a step of generating a single output current signal by calculating the currents output from said rectifying means of said plurality of converters,

a step of generating a second error signal by comparing said single output current signal with said first error signal amplified and of amplifying said second error signal, and

a step of generating PWM signals on the basis of said second error signal amplified and of PWM controlling said respective plurality of switching means.

9. The control method for a switching power supply in accordance with claim 8, wherein at said step of PWM controlling said switching means, a triangular wave generator outputs a reference triangular wave signal, a comparator compares said reference triangular wave signal with said second error signal amplified, and a distributor generates a PWM signal on the basis of the comparison result of said comparator and PWM controls said switching means corresponding thereto.

10. The control method for a switching power supply in accordance with claim 8 wherein each of Q pieces of converters has a plurality of capacitors connected in series across the input terminals, and each of said capacitors are connected to different switching means, wherein the triangular wave generators of Q pieces of PWM signal generators output reference triangular wave signals having a phase difference of π/Q therebetween, PWM signals are generated by using said reference triangular wave signals, and the switching timing of each converter is changed.

11. A switching power supply comprising:

a plurality of converters, each comprising a plurality of switching means, transforming means and rectifying means, connected in series on the input sides and in parallel on the output sides, thereby outputting a single output DC voltage,

a first error amplifier for generating a first error signal by comparing said single output DC voltage output from said converters with a reference voltage and for amplifying said first error signal,

a second error amplifier for generating a second error signal by comparing the current signal output from said rectifying means of one of said

plurality of converters with the output of said first error amplifier and for amplifying said second error signal, and

a plurality of PWM signal generators for generating PWM signals on the basis of the output signal of said second error amplifier and for PWM controlling each of said plurality of switching means.